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**Metamorphoses of *Leptocephalus brevirostris*.**—A description of the transformation of *Leptocephalus brevirostris* into *Anguilla vulgaris* has been published by G. B. Grassi and Dr. Caulandruccio. The reality of the metamorphoses described has been confirmed by the characteristics of another specimen of *L. brevirostris* captured last January by Dr. Silvestri in the Straits of Messina. (1) The head and point of the tail has noticeably acquired the special characteristics of the eel. (2) The larval teeth have totally disappeared, while the distinctive ones seem entirely absent. (3) It lacks all traces of pigment. (Atti della Reale Accad. Lincei, VI, 1897, p. 239.)

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## ENTOMOLOGY.<sup>1</sup>

**An Ant-Inhabiting Mite.**—M. Charles Janet continues his interesting records of Myrmecophilous insects (Comptes Rendus, 1897, p. 583–585). His latest study relates to the peculiar mite *Antennophorus uhlmanni* and its host *Lasius mixtus*. The mite lives on the ant as an epizoön. “It fixes itself on the lower surface of the head or on the sides of the abdomen of its host by means of the carunculæ in which its feet terminate, and which are furnished with a very adhesive sticky substance.

These parasites are blind, but the first pair of feet is transformed into long antenniform appendages provided with very sensitive olfactory organs. They do not wander about in the galleries of the nest, but walks over the bodies of the ants, passing from one to another. When an *Antennophorus*, detached from the body of an ant, lies upon the soil in one of the galleries of the nest, it raises and stretches forward its first pair of ambulatory feet and at the same time it explores the space around it with its long antenniform feet. These appendages are much more agitated when an ant passes close by. If it pass near enough, the Acarid glues itself on to its body by means of the cup of sticky material on the end of one of its ambulatory feet, which it holds up ready for this operation, and it can in this way soon climb up and fix itself in a good position on its host. This latter is surprised, and seeks to rid itself of the new comer, but failing in this it becomes resigned very quickly as soon as the Acarid has taken up one of its normal positions.

<sup>1</sup> Edited by Clarence M. Weed, New Hampshire College, Durham, N. H.

Generally a working ant only carries a single *Antennophorus*, but they may very often be seen carrying several. In all cases the parasites take up positions symmetrical with the sagittal plane of their host's body, and it thus comes about that the center of gravity of the extra load is placed in the sagittal plane of the carrying ant.

The Acarids are also under the best conditions for not hampering the movements of the ants, and, as a consequence, for being the more readily tolerated by them. The *Antennophorus* directs its antenniform feet toward the front of the ant if fixed upon its head, and in the reverse direction if fixed upon its abdomen. When an ant carries but one *Antennophorus*, it is almost always placed on the head of the host. The case of an ant carrying an *Antennophorus* under its head and one on either side of the abdomen is very common. The presence of one or more of the parasites on the body of a *Lasius* does not prevent the latter from taking its share in the work of the colony and in particular the carriage of the larvæ and rubbish.

The *Antennophorus* attaches itself freely to the naked nymphs, but never to a nymph enveloped in a cocoon. Thus in an experimental nest consisting of some fifty ants, all carrying a single *Antennophorus* and accompanied by a certain number of nymphs, I found on the following day a newly emerged ant which bore seven *Antennophori* arranged symmetrically as follows: two (one on the top of the other) on either side of the head and on the abdomen, one on the middle of the dorsal region and one on either side. It would appear that the *Antennophorus* is attracted to the young ants on account of the care with which they are looked after and fed by their older companions. These latter do not seek to drive away the parasites which spread themselves a little later. At the moment when a queen throws off her nymphal envelope the workers come to her assistance, and as the workers carry the *Antennophori*, these latter generally take advantage of the position to pass over to the body of the newly emerged queen.

The *Antennophorus* feeds exclusively on the nutritive fluid disgorged by the ants. Fifty *Lasii* carrying *Antennophori* were placed in an observation nest and left without food. Eight days later the ants were in perfect condition, but ten or more *Antennophori* had already died of hunger. A tiny droplet of honey tinted with Prussian blue was allowed to run over the lower face of the glass plate which formed the roof of the nest. A large number of ants, nearly every one of which carried an *Antennophorus*, ranged themselves as closely as they could be packed all around the drop. The *Antennophori* had no share in the meal, and they were obliged to retire a little because there was no

room for them between the heads of their hosts and the glass to which they were applied. The ants of this brood had acquired the habit of placing themselves, crowded one against the other, in one corner of the nest, and there they came with their crops well filled after the meal of blue-honey, and there they disgorged before the mouths of their comrades who had none. Now the ant in the act of disgorging opens its mandibles wide. The peristaltic movements of the œsophagus and the movements of the pharynx brought up the globules of honey, the blue color of which made them readily visible, and they formed a little drop in front of the mouth. While the fasting ant was eating the honey thus disgorged, the *Antennophorus* riding on its head took its share. To do this it pushed itself forward and thrust its rostrum into the drop-let. Generally, while holding itself in position by means of the two hinder pairs of legs, it attached itself by means of the forward pair to the head of the disgorging ant. Very often, when the fasting ant had ended its meal and was retiring, one would see the *Antennophorus* try to keep its hold on the disgorging ant. The two *Lasii* generally lend themselves to this prolongation of the meal, and if they are slightly separated from one another, the *Antennophorus* stretches itself to its full length, and forms, back downwards a sort of bridge between the heads of the two ants.—*Annals and Magazine of Natural History*.

**The Spread of the Asparagus Beetle.**—In the recent Year-book of the U. S. Department of Agriculture, Mr. F. H. Chittenden describes the distribution of *Crioceris asparagi* in America. He writes:

From the scene of its first colonization in Queens County, New York, the insect migrated to the other truck-growing portions of Long Island, and may now be found at Cutchogue, toward the eastern end of the island. It soon reached southern Connecticut, and has now extended its range northward through that State and Massachusetts to the State line of New Hampshire. Southward, it has traveled through New Jersey, where it was first noticed in 1868, eastern Pennsylvania, Delaware and Maryland to southern Virginia.

Its distribution by natural means has been mainly by the flight of the adult beetles. Undoubtedly, also, the beetles have been transported from place to place by water, both up and down stream by rising and falling tide, as the fact that it has not until recently deviated far from the immediate neighborhood of the sea coast and of large water courses near the coast bears abundant testimony.

Another reason for the present prevalence of this species in these localities is that asparagus was originally a maritime plant and has

escaped from cultivation and grown most luxuriantly in the vicinity of large bodies of water. It is well known that it is usually upon wild plants that the insect first makes its appearance in new localities. There is evidence also that its dissemination may be effected by what Dr. Howard, who has made a special study of the distribution of this and other imported insect pests, has termed a "commercial jump," either by commerce in propagating roots, among which the insect may be present either as hibernating beetles or as pupæ, or by the accidental carriage of the beetles on railroad trains or boats.

Only by some such artificial means of distribution has it in later years found its way to northwestern New York, in four counties between Rome and Buffalo, and to Ohio, where it now occupies a similar territory of four counties between Cleveland and the Pennsylvania State line. During the past summer Dr. Howard traced its course along the Hudson River above Albany. Inquiry instituted by Mr. F. M. Webster concerning the Ohio occurrence disclosed the fact that the plants in one locality were brought from New York. Its presence in eastern Massachusetts in like manner may be due to direct shipments of roots from infested localities to Boston and vicinity.

It is noticeable that its inland spread, except in the neighborhood of water, has been extremely limited. It is present now in what is known as the Upper Austral life zone, although in certain points in New England it has located in what is considered the Transition zone. Its course up the Hudson River lies within a rather narrow strip of Upper Austral, and its location in the vicinity of Mechanicsville, about twenty miles north of Albany, marks its present most northern location. In all probability it is destined in time to overspread the entire Upper Austral zone and to make its way to some extent into neighboring areas in which it may find conditions for its continuance.

**Notes.**—In Bulletin 67, from the Kentucky Experiment Station, Prof. H. Garman discusses the San José Scale.

The Colorado Potato Beetle in Mississippi is the title of Bulletin 41 of the Experiment Station of that State. It was prepared by Mr. H. E. Weed, who shows that this pest is gradually approaching the Gulf Coast.

Mr. M. V. Slingerland treats of "The Army Worm in New York" in Bulletin 133 of the Cornell University Experiment Station.

W. M. Schöyen publishes (*Entomol. Tidskrift*, 1896, pp. 111-112) a short bibliography of Norsk Entomology for 1894-5.

Mr. Nathan Banks has described a number of new Neuroptera from North America (*Trans. American Entomological Society*, XXIV, 21).